

CLAIMS

I claim:

1 1. A self-locking linear adjustment mechanism comprising:
2 a locking tumbler;
3 an adjustment vernier;
4 two end adapters;
5 two roll pins;
6 two precision balls;
7 two locking skirts;
8 two springs;
9 two locking splines;
10 two index pins; and
11 two guide shafts,
12 wherein the self-locking linear adjustment mechanism has a
13 dual function self-locking feature.

1 2. The self-locking linear adjustment mechanism according to
2 claim 1, wherein the locking tumbler is a longitudinally extending
3 member that extends for a predetermined distance and has two
4 opposing ends, each end having a recess defined therein.

1 3. The self-locking linear adjustment mechanism according to
2 claim 2, wherein the locking tumbler further comprises two opposing
3 pockets configured to enable placement and retention of the two
4 precision balls.

1 4. The self-locking linear adjustment mechanism according to
2 claim 3, wherein the balls are positioned not to be in contact with
3 faces of the locking splines when the self-locking linear
4 adjustment mechanism is in a locked position.

1 5. The self-locking linear adjustment mechanism according to
2 claim 3, wherein the balls are guided by a diameter of the internal
3 spline of the adjustment vernier.

1 6. The self-locking linear adjustment mechanism according to
2 claim 1, wherein the locking tumbler is secured in place axially by
3 two standard roll pins that tangentially engage grooves in the
4 locking tumbler.

1 7. The self-locking linear adjustment mechanism according to
2 claim 1, wherein the adjustment vernier includes a central member
3 with two tubular members extending longitudinally away from the
4 central member in opposing directions.

1 8. The self-locking linear adjustment mechanism according to
2 claim 1, wherein each tubular member includes proximal and distal
3 ends relative to the central member of the adjustment vernier, and
4 a plurality of slits equally spaced about an associated tubular
5 member.

1 9. The self-locking linear adjustment mechanism according to
2 claim 8, wherein each tubular member is externally threaded in a
3 predetermined manner for a predetermined distance from the distal
4 end to the proximal end of an associated tubular member.

1 10. The self-locking linear adjustment mechanism according to
2 claim 9, wherein each tubular member has a predetermined inner
3 circumference at the proximal end that is less than a predetermined
4 inner circumference at the distal end of the tubular member.

1 11. The self-locking linear adjustment mechanism according to
2 claim 1, wherein each end adapter longitudinally extends for a
3 predetermined distance, has inner and outer ends, the inner end of
4 the end adapter being configured for engaging the distal end of a
5 corresponding tubular member of the adjustment vernier, and the
6 outer end of the end adapter being configured for engaging another
7 element.

1 12. The self-locking linear adjustment mechanism according to
2 claim 1, wherein between the inner end and the outer end of each
3 end adapter a passage inhibitor is provided that includes a hole
4 defined therein configured for allowing a correspondingly
5 configured guide shafts to pass therethrough.

1 13. The self-locking linear adjustment mechanism according to
2 claim 1, further comprising roll pins configured for securing the
3 locking tumbler axially in place by tangentially engaging grooves
4 in the locking tumbler. and corresponding holes in the adjustment
5 vernier.

1 14. The self-locking linear adjustment mechanism according to
2 claim 1, wherein the locking skirts are configured for fitting
3 around an assembly of locking splines, index pins, and guide
4 shafts.

1 15. The self-locking linear adjustment mechanism according to
2 claim 14, wherein the locking skirts extend for a predetermined
3 length and have an inner end and an outer end, the inner end being
4 configured for being placed proximate the central member of the
5 adjustment vernier, and the outer end being configured with a
6 raised spherical shoulder for engaging the distal end ramp of the
7 corresponding tubular member of the adjustment vernier.

1 16. The self-locking linear adjustment mechanism according to
2 claim 1, wherein each locking spline extends for a predetermined
3 length and has an inner end and an outer end, the inner end of each
4 locking spline having a plurality of external splines configured
5 for engaging with internal splines at the proximal end of the
6 tubular elements of the adjustment vernier.